

Wind Power Procurement

Mike Santoro

Air Force

Civil Engineer Support Agency

Tyndall AFB FL

850-283-6463

mike.santoro@tyndall.af.mil

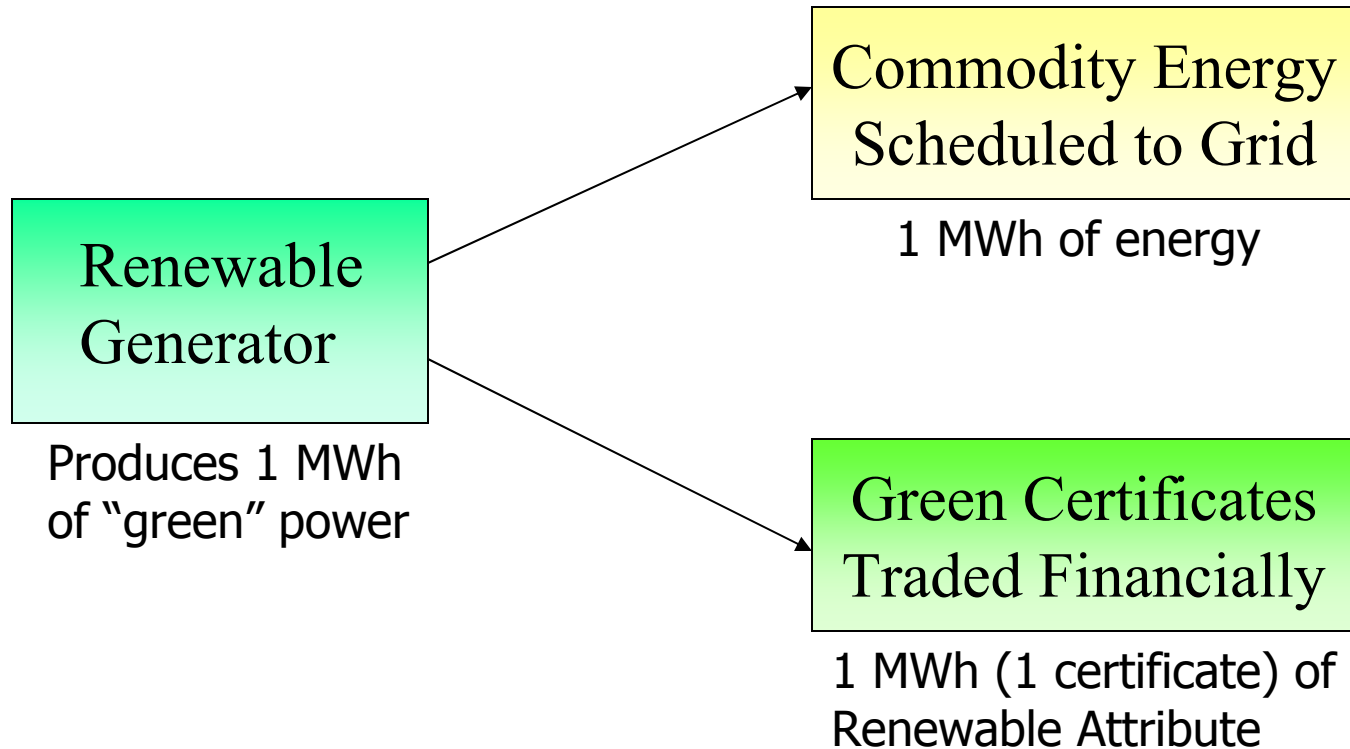


Ways to Procure Wind Power

- Install on-site wind generation
 - Small turbines – 0.5 to 100 KW, 9 mph avg
 - Large turbines – 100 to 2 MW, 13 mph avg
 - Must have site and wind
- Buy wind generation (commodity)
 - Buy electrons and arrange transmission and scheduling
 - Can take advantage of wind resources nationwide
- Buy wind tags (certificate)
 - Financial paperwork transaction
 - Each tag represents 1 MWh of generation
 - Can take advantage of wind resources nationwide



Green Power Is Unbundled Into Two Products



"Treasure the  Experience"
tampa

How to Buy?

- Regulated states
 - Utility companies offer customers choice of buying blocks of wind generation
 - Usually a premium added to normal cost
- Deregulated states
 - Customers can choose competitive service provider who can provide wind generation
 - Price can be competitive with non-renewable price

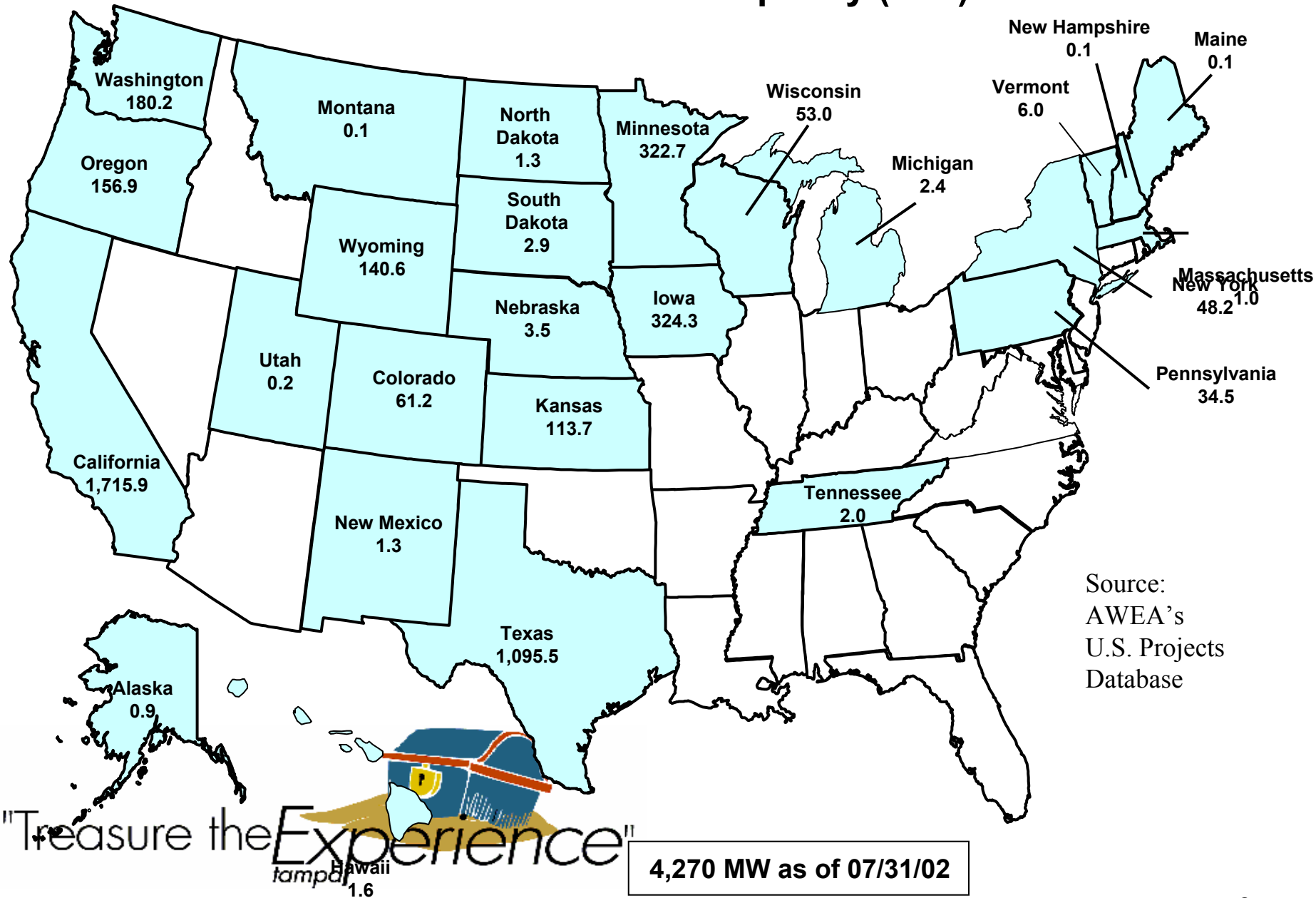


How to Buy? (Con't)

- Wind tags
 - Environmental attributes separated from energy commodity
 - Can be purchased in either regulated or deregulated states
- Utilities and marketers that offer wind power products
(www.eren.doe.gov/greenpower)



United States Wind Power Capacity (MW)



"Treasure the Experience"

Criteria to Buy?

- Offset emissions from operations
- Reduce exposure to price volatility
- Meet renewable goals
- Support community and utility programs
- Price and contract length



Renewable Tags Market Prices By Source Type

Price Range per Tag



Solar

\$20 – 120 MWh



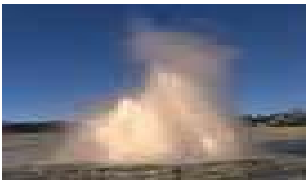
Wind

\$8 – 40 MWh



Small, low-impact hydro

\$3 – 4 MWh



Geothermal

\$3 – 4 MWh



Biomass

\$2 – 6 MWh



AF Wind Buys

Generation:

<u>Base</u>	<u>Contract</u> <u>Term</u>	<u>Annual</u> <u>MWh</u>	<u>Unit</u> <u>Cost</u>	<u>Annual</u> <u>Cost</u>
Edwards AFB CA	5 yrs	133,500	7.8 cents/kwh	\$10,413,000
Minot AFB ND	"	3,960	2.5 cents/kwh premium	99,000
Fairchild AFB WA	"	7,818	1.1 cents/kwh premium	86,000
Grand Forks AFB ND	"	1,800	3.0 cents/kwh premium	54,000
Cannon AFB TX	"	1,800	3.0 cents/kwh premium	54,000
Lackland AFB TX	"	1,800	3.0 cents/kwh premium	54,000
Schriever AFB CO	"	1,800	2.5 cents/kwh premium	45,000



AF Wind Buys (Con't)

Tags:

	Contract	Annual	Unit	Annual
<u>Base</u>	<u>Term</u>	<u>Mwh</u>	<u>Cost</u>	<u>Cost</u>
Ellsworth AFB SD (Native American)	5 yrs	2,160	2.5 cents/kwh	\$54,000
FE Warren AFB WY	5 yrs	2,160	2.5 cents/kwh	54,000



Summary

- Buying wind power can be faster and easier than building generation
- Buying doesn't need site and wind speed
- There is a lot of capacity available and the amount is growing rapidly
- Buying wind tags is a quick paperwork transaction that can be done regardless of the status of regulation
- Benefits are many and cost has become very competitive
- Buying wind power by the AF has been very successful to date and we are continuing to pursue buying where feasible

